

wind is to visit an eyrie and hurl the eggs or young to the west into the sea, and for an east wind to go to the other side of the island; and this is surer than hammering a line of holes in a granite boulder in the direction from which you want the wind to come—also, if an eyrie is close by, it is quicker.

April 10 to May 1 is the usual time for eggs; after that young are very likely to be found. No young had been hatched when the island was left on May 1, 1915.

XXII.—*The assumption of Summer Plumage in Pyromelana oryx.* By A. G. BUTLER, Ph.D., F.L.S., F.Z.S., M.B.O.U.

It has been definitely asserted by Mr. Jonathan Dwight, Junr., and others, that a feather when once perfected is incapable of colour-change and that the apparent change which takes place at the assumption of the summer plumage is due to the falling off or abrasion of the tips or fringes of the feathers. That this is the case in some species is certain; but it is equally certain that in many species there is an actual change of colour in the feathers themselves, as I pointed out in a short article which I sent to 'The Ibis' in 1897, where I described changes of plumage in *Quelea quelea* and *Pyromelana franciscana* and *P. afra*.

In Stark and Selater's 'Birds of South Africa,' vol. i. p. 131, the authors confirm my statement as to the gradual change of colour in the feathers themselves at the assumption of the summer plumage in the case of *Pyromelana capensis*. They say:—"Only the feathers of the lower back, rump and flanks are entirely changed by a moult, the remaining plumage and bill becoming darker, owing to a gradual absorption of colouring matter, the change first appearing at the point of the lower mandible."

As I have elsewhere pointed out, if the plumage of birds were incapable of change by absorption of colouring after it had attained its full growth, it would be impossible for the

Touracos to regain the scarlet colouring in their feathers after it had once been washed out, and it would be equally impossible for disease or death to dull the plumage of birds, as it undoubtedly does.

In September 1906, Major Horsbrugh sent me a male example of *Pyromelana oryx* in summer plumage. This bird has regularly moulted each year at the approach of winter, and very early in the year has commenced to reassume the summer plumage. The change is extremely gradual, beginning sometimes as early as the end of January and not perfectly completed until late in May. This year the bird became ill in the first week of April and died on the night of the 5th-6th, exhibiting the transition plumage from the winter to the summer dress to perfection: the feathers of the eyebrow-streak are yellow, those of the chin and cheeks are tinted with yellow inclining to orange, the nape is rapidly assuming its orange colouring, but at the sides and back it is still suffused with the brownish winter colouring, the brown plumage of the mantle and centre of back are washed with reddish orange and the feathers of the lower back are more or less tipped to all appearance with bright golden-orange, but in this case a moult has probably taken place, although the white flank-feathers are partly tipped with the same colour; some of the buff-brownish feathers of the breast are already fringed with black.

An examination of this bird in its transition plumage should be enough to convince even the most sceptical that the assumption of the summer plumage is sometimes attained by a change of colour in the feathers, and not by a partial or complete moult of the feathers.

I still have an example of *Cyanospiza cyanea* in a somewhat similar transition plumage and, in spite of Mr. Dwight's contrary opinion, am perfectly satisfied that it also assumes its summer colouring in the same manner. If the brown plumage were moulted out in the spring and replaced by the blue and green of the summer dress, why should a bird which dies in the middle of its change exhibit a winter plumage washed over with the summer colouring? Is it conceivable

that there is a double spring moult, first into a transitional and then into a distinct summer dress? And what becomes of the moulted feathers, since the most careful search does not discover them to the owner of the bird?

I shall forward my dead bird to the Natural History Museum at South Kensington, where it will be available for examination and therefore of more use than in my own cabinet.

[The example of *Pyromelana oryx* referred to by Dr. Butler is now in the British Museum, and does not in our opinion, or that of others who have examined it, warrant the conclusion that the colour-change is brought about by the absorption of fresh-colour by the old feathers. Both it and other examples, especially one collected by Mr. Swynnerton in Rhodesia in November (reg. no. 1911.5.30.394), show undoubted signs of moult.—Ed.]

XXIII.—*Field-notes on some of the Waterfowl of the Argentine Republic, Chile, and Tierra del Fuego.* By F. E. BLAAUW, C.M.Z.S., M.B.O.U.

(Plate XIV. & Text-figure 12.)

In some previous papers I have given details of the breeding and development of some of the Waterfowl of South America from experiences gathered on birds kept by me at Gooilust. In the spring of 1911, during a trip to South America\*, one of my objects was to see as much as I could of the Waterfowl of that country.

In the following notes I give the results of my observations concerning those Waterfowl in their native haunts. My route was as follows:—

From Buenos Ayres, across the Andes to Santiago, from Santiago southward, crossing and recrossing the Andes between the Lake Todos los Santos and the Nahuel Huapi Lake, from there to Puerto Montt, back northwards to Corral, by ship to Punta Arenas; from Punta Arenas to

\* See 'Notes from the Leyden Museum,' vol. xxxv. 1912, pp. 1-74.